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1989

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An empirical comparision of equilibrium with
disequilibrium models.

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Research Memorandum 1989-40 augustus 1989

VRIJE UNIVERSITEIT
FACULTEIT DER ECONOMISCHE WETENSCHAPPEN
EN ECONOMETRIE
AMSTERDAM

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For presentation at the EALE Conference, Turin, Sept. 8-10, 1989
(Theme III, The implications for social security systems of changing labour market and demographic structures)

Preliminary version, August 1989

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F.A.G. den Butter and B. Compaijen*

1. Introduction

As compared to other industrial countries the Netherlands has a highly developed social security system. Social security contributions amount to almost 25% of national income, whereas transfers to households sum up to a total of more than 30% of national income. The parallel rise of social security payments and unemployment in the last decades has led to the suggestion that the malfunctioning of the labour market, and hence the growth of unemployment, can in some way be associated with the affluent social security. However, most empirical studies, both on a macroeconomic and on a microeconomic level, show rather small labour market effects of social security (see e.g. Atkinson, 1981; Springer et al., 1988). This is particularly true for simulations by means of macroeconomic models that are typically used for policy analysis in the Netherlands.

This conclusion is, however, conditional on the specification of the policy models. Dutch macroeconomic policy models, as well as many models in the Tinbergen tradition for other countries, can be characterized as disequilibrium models and have their counterparts in the theoretical literature under the heading of the neo-classical Keynesian synthesis. Equilibrium models are the antipodes of these disequilibrium models. Minford's (1983) model for the labour market is a well known example of these equilibrium models. An interesting aspect of the Minford model is that it indeed shows a large impact of social security on the labour market (in the case of the United Kingdom and Germany; for the latter country see Davis and Minford, 1989).

Against this background the present paper compares the working of a Minfordian type of equilibrium model with the working of the traditional Dutch disequilibrium policy models. The paper investigates to what extent the measured effects of the social security system on the labour market depend on the way of modelling the social security system. To that end we consider the working of 5 models for the interaction between labour market, goods market and foreign exchange market in alternating equilibrium and disequilibrium conditions. Special attention is paid to the modelling of social security influences, viz. replacement ratios (benefit wage ratios) and social security contributions.

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The first two models are equilibrium models, and inspired by Minford, though quite different in elaboration. In the other 3 models we consecutively replace the specifications of the model equations which are typical to the equilibrium model by specifications which stem from the traditional Dutch policy models. Therefore the last model can be considered as a stylized representative of the Dutch policy models. The working of the models is analyzed by means of impulse simulations and by sensitivity analysis.

The next section shortly reviews the equilibrium model and the way we have adapted it for the Netherlands. Section 3 describes the consecutive replacement of equilibrium conditions by disequilibrium conditions in the models. Moreover, this section gives a short impression of the various equations contained in the models. Sections 4-7 illustrate the differences in the working of the models. Finally section 8 summarizes the results and gives some conclusions.

2. Minford's equilibrium model for the Netherlands

Minford (1983) proposes a model for labour market equilibrium in an open economy. This model boils down to an extended version of the classical model. However, nominal prices are absent in the model and no consideration is given to the money market. The goods market is implicitly assumed to be in equilibrium. The real exchange rate, as a measure of competitiveness towards foreign countries, takes care of equilibrium on current account and the real wage rate is the equilibrating value on the labour market. Minford introduces two main new features in the submodel for the labour market. Firstly, he distinguishes between a union and a non-union sector. Wages in the non-union sector are equilibrium values and union wages are determined by a variable mark-up to non-union wages. Secondly, the supply of labour is dependent upon the wage level and the benefit level, both real net values. When benefits are high relative to wages, implying a replacement ratio close to one, effective labour supply is small and elastic. In the high wage level range effective labour supply is inelastic and approaching the registered working age population.

Because the union scene is quite unique in Great Britain and seems to have little relevance for the Netherlands, we dismissed the distinction between a union and a non-union sector. The remaining model of the labour market retains the Minfordian flavour as to social security but diverges in analytical treatment. In our approach the equilibrium character of the full model is preserved initially but later on exchange rate, wage and price rigidities are introduced into the model. For more details and for estimation results of the Minfordian model for the Netherlands we refer to Compaijen et al. (1989).

3. Equilibrium and disequilibrium: five policy models

This paragraph summarizes the models used for the impulse simulations. For a complete listing of the models and their equations we refer to the annex. All models are specified on the basis of quarterly data. The models, called M1 to M5, have a great deal in

common, but differentiate in one important respect at a time. Switching from the one model to the other we usually replace an equilibrium condition by a price setting function for a particular market. Minor modifications go with it.

In M1 we have equilibrium on the labour market and on the current account. The goods market is not modelled explicitly. We call this model "Minfordian" because it is rather close, more so than the other models, to Minford's original model.

In M2 we assume the nominal exchange rate to be exogenously determined, so equilibrium on current account is no longer guaranteed. For the Netherlands this assumption of exogenous exchange rates is more realistic than that of flexible exchange rates, as the Dutch central bank wants to maintain exchange rate stability between the Dutch guilder and the German mark. The goods market, modelled along Keynesian lines, is now incorporated into the model. Goods market equilibrium is secured by flexibility of the general price level, represented by the price index of demand. The equilibrium forces on this market operate mainly through the real exchange rate. Nominal price fluctuations, coupled with a fixed nominal exchange rate, cause the real exchange rate to fluctuate. In case of excess demand the domestic price level rises, hence the real exchange rate of the own currency in terms of foreign currency rises. The induced fall in exports and rise in imports brings about a reduction in excess demand which goes on until equilibrium is restored. In M2 the labour market has retained its equilibrium character. Since in this model the current account equilibrium is in fact replaced by the goods market equilibrium condition and therefore the model retains its character as an equilibrium model, we call it the "alternative Minfordian model".

In M3 we have no longer labour market equilibrium. Real wages do not take their equilibrium values because nominal wages have some rigidity due to wage setting processes. We do not want to dwell on the character of these processes, which are assumed to be part of labour market behaviour, but are interested in their implications. The goods market is still considered to be an equilibrium market, while the nominal exchange rate as in the previous model is exogenous and remains so in the next two models.

In M4 besides disequilibrium on the labour market we assume disequilibrium on the goods market. In this model there is not implicit pricing through an equilibrium condition but explicit pricing through a price setting function.

Model M5 finally is a variant of M4. The difference is that full capacity demand for labour is determined by a vintage type of model in stead of the Cobb-Douglas production function that is used in the models M1 through M4. This modelling of productive capacity and of labour demand makes M5 closest to the models actually used in Dutch policy analysis. Table 1 summarizes the main characteristics of the five models considered in this paper.

We continue with a comment on the individual equations and start with labour demand. In the models with equilibrium on the goods market (M1, M2 and M3) labour demand equals full capacity labour

demand. With profit maximization and a Cobb-Douglas production function labour demand can be explained by a real wage variable, the capital stock and a time trend (see eq. 1 of the annex). Equilibrium in the labour market is brought about by w_r, the real wage rate, earnings divided by the price index of demand. Relevant to labour demand is real labour cost, reason why we correct the real wage rate for social security contributions of employers and terms-of-trade losses. For the time being the capital stock has a zero coefficient. However, steady capital growth is expressed by the time trend, which also incorporates technological progress. When the possibility of disequilibrium on the goods market opens up in M4 a term for the effects on labour demand of underutilization of capital should be added to the aforementioned specification. After having explained labour demand we can determine the **supply of goods** or **productive capacity** with the production function (eq. 6a).

Table 1. The models in outline.

Models Equations	M1	M2	M3	M4	M5
Labour demand	Non-vintage approach	Idem	Idem	Idem	Quasi vintage approach
Labour supply	Minfordian effective labour supply	Idem	Minfordian measured labour supply	Idem	Idem
Wage formation	Equilibrium wages	Equilibrium wages	Wage setting	Wage setting	Wage setting
Demand for goods	-	Keynesian	Idem	Idem	Idem
Supply of goods	Non-vintage approach	Idem	Idem	Idem	Quasi vintage approach
Price formation	-	Equilibrium prices	Equilibrium prices	Price setting	Price setting
Exchange rate formation	Real exchange rate determined by trade balance equilibrium	Exogenous nominal exchange rate	Idem	Idem	Idem

In M5 labour demand and productive capacity are represented within a **quasi vintage approach** (eq. 2). In this approach the influence of real labour cost and real capital cost on the economic life of capital, which is characteristic for a vintage model, is transmitted directly, i.e. without taking account of the changing age structure of capital. The main endogenous variables that determine full capacity labour demand and productive capacity are the capital stock, resultant of investment and scrapping, and real labour cost (through the index of scrapping). Actual labour demand equals full capacity labour demand after allowance has been made for underutilization of capacity (Okun's Law). For more details on this quasi vintage approach we refer to Den Butter (1987).

Now we turn to the **supply of labour**. In the models with equilibrium on the labour market (M1 and M2) we assume that effective labour supply is less than measured labour supply, the difference being determined by the height of net real wages and the replacement ratio. The willingness to work increases with rising wages and a falling replacement ratio. The curvilinear specification is derived from constrained utility maximization with a CES utility function in income and time not worked. The total income of the supplier of labour is made up of wages earned by working and (lower) benefits "earned" by not-working. The supposition

that the labourer who voluntarily chooses not to work is eligible for an unemployment benefit is a simplification. Effective labour supply is not registered but should in equilibrium be equal to labour demand (eq. 3a).

In the models with disequilibrium on the labour market (M3, M4 and M5) measured labour supply in stead of effective labour supply is thought to be dependent upon real net wages and the replacement ratio. The decision to enter the labour market is here at stake. As far as this decision is influenced by replacement ratios these should be seen as indications of benefits other than because of unemployment, e.g. old age, persons unfit to work and relief. It is supposed that not more than 62½% of the working age population will engage in the labour force. Contrary to models M1 and M2 where unemployment is voluntary in models M3 through M5 unemployment is involuntary. In order to have the models with disequilibrium on the labour market as much as possible in conformity with the equilibrium models we have specified the labour supply equation (3b) analogous to equation (3a). However, it should be realized that not necesserily the same mechanism is at work here. Moreover, the replacement ratio may not be the proper variable to represent the influence on participation decisions in the disequilibrium context.

In the equations for the volume of **exports and imports** (all five models) we have both a scale variable and a relative price variable as explanatory variables. The scale variable, world trade for exports and national product for imports, has an elasticity of one. The relative price variable, expressed by the real exchange rate, has a long run elasticity of -2 towards exports and a long run elasticity of 0.75 towards imports. Moreover, the volume of imports increases with the utilization rate of capacity (eq. 4).

The other **expenditure** equations (all models except M1) are rather straight (eq. 5). The volume of consumption is dependent upon disposable wage income, the real rate of interest and the money stock. The explanatory variables for the volume of fixed investments are the volume of national product, the real rate of interest, the money stock and the utilization rate of capital. Inventory formation is a fixed proportion of national income. National product is total expenditure minus imports.

Wage formation is either implicit through labour market equilibrium (M1 and M2; eq. 7a) or explicit through wage setting (M3, M4 and M5; eq. 7b). The variables that determine the outcome of wage negotiations are first of all the price index of demand and labour productivity. Besides the wage level is linked with the utilization rate of labour (a kind of Phillips-curve effect) and the tax and social premiums rates.

Price formation is rather analogous to wage formation. Prices are determined either by equilibrium on the goods market (M2 and M3; eq. 8a) or by price setting (M4 and M5; eq. 8b). Price setters take account of labour cost, labour productivity, taxes, the utilization rate of capital and import prices. This last variable has a dual role: cost component and competitive price. Through

definitions the price index of national product and the price index of demand are related to each other (eq. 8d or 8e).

The exchange rate adopts equilibrium values only in model M1, equilibrium meaning here a zero balance on current account (eq. 9a). In the other models the nominal exchange rate is exogenous. The real exchange rate is defined as the price index of demand, relative to the index of import prices measured in the home currency (eq. 9e).

The specifications of the equations of the models and the selected values of their coefficients are, for a major part, based on the empirical literature. In this selection process the outcomes of the Dutch policy models have played a prominent part. The estimates for the non-vintage labour demand and the labour supply equations are based on Compaijen et al.'s (1989) study of the Minford model for the Netherlands. Hence, the coefficients are, for the purpose of this paper, deliberately not determined by estimation. Our procedure aims at exploiting as much as possible the empirical knowledge on the Dutch economy obtained in the course of time. Of course, selecting specifications of equations and values of coefficients from the literature is rather arbitrary. Yet, in our opinion, such a compilation of empirical knowledge exploits much more information than a mere respecification and re-estimation of behavioural relationships that have extensively been studied before. Moreover, experience tells that a re-estimation of traditional macroeconomic behavioural equations always needs a look at other empirical evidence in order to obtain plausible estimates.

After the selection of the specifications of the equations and the values of the coefficients, the performance of the models to describe the past is tested by a dynamic simulation over the period 1973:I - 1986:IV. The results of these dynamic simulations appear to be satisfactory in most cases, albeit that labour supply shows rather large ex post prediction errors.

4. The working of the models

We illustrate the differences in the working of the models by means of impulse simulations, representing exogenous shocks to the economy. These shocks are simulated by means of a permanent and autonomous change in the respective exogenous variables over a period of 24 quarters (6 years). The baseline projection is based on the values of the exogenous variables in the fourth quarter of 1986. The shocks are supposed to occur in the first quarter of the simulation period. The effects of the impulses are measured as differences from the baseline projections. In each behavioural equation the constant term is set equal to its mean value in the reference period, given the selected values of the coefficients.

First we calculate the effects of autonomous shocks in world trade and foreign prices. The effects of a once and for all increase in the level of world trade are given in table 2.

Table 2. The effects of an increase in world trade by 10%.
(in % of the baseline projection, unless stated otherwise)

on	according to	Mod M1 (Minfordian model)		Mod M2 (altern. Minf. model)			Mod M3 (disequ. labour market)			Mod M4 (disequ. goods& labour market)			Mod M5 (idem, vintage approach)		
	after	1qu	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr
Volume of income (y)		0.0	0.0	0.1	0.1	0.1	2.1	0.6	0.6	3.4	2.4	2.4	3.5	2.7	3.3
Volume of exports (b)		-1.3	-1.3	2.4	2.4	2.2	5.4	3.1	3.0	10.0	10.1	10.3	10.0	10.2	10.5
Volume of imports (m)		4.2	4.2	2.9	2.8	3.0	3.7	3.1	3.2	7.2	9.9	11.1	7.0	9.2	9.8
Expenditure price level (p_e)		-	-	9.3	3.7	3.7	5.5	3.4	3.3	0.0	-0.1	-0.2	-0.0	-0.2	-0.2
Real wage level (w_r)		3.1	3.1	4.9	2.0	2.0	-2.2	0.6	0.4	0.6	2.0	2.3	0.5	2.4	2.9
Real exchange rate (x)		5.6	5.6	9.3	3.7	3.7	5.5	3.4	3.3	0.0	-0.1	-0.2	-0.0	-0.2	-0.2
Demand for labour (e)		0.0	0.0	0.1	0.1	0.1	2.2	0.5	0.6	1.6	0.8	0.7	0.5	1.2	1.1
Unemployment (U) (in labour years x1000)		-	-	-	-	-	-86	-21	-22	-60	-26	-23	-18	-45	-37

In order to be able to solve the Minfordian model M1, we had to remove the adjustment lags from the equations for imports and exports (eq. 4a and 4b) and set the respective coefficients to their long term elasticity values. Therefore M1 is specified without a dynamic structure so that the impulse effects are the same all over the simulation period. By way of a reminder all tables of this paper give the impulse effects of M1 for the first and the last quarter of the simulation period only. The results in the first column of table 2 show that the increase in world trade has, according to M1, no effect on national product and on labour demand. An appreciation of the guilder, which amounts to 5.6%, more than fully does away with the positive effect of the increase in world trade on the value of exports, so that finally the volume of exports decreases by 1.3%. The appreciation makes the volume of imports rise by 4.2%. This remarkable reaction on a world trade shock is dictated by the somewhat implausible assumption of M1 of continuous trade balance equilibrium. A rise of real wages of 3.1% in response to the rise of the real exchange rate of 5.6% preserves the assumed labour market equilibrium.

In the alternative Minfordian model M2 (column 2 of table 2) the price level and hence the real exchange rate increase almost by 10% in the first quarter in order to secure equilibrium on the goods market. The effects are much smaller in the long run. Now there is no trade balance equilibrium so that, according to this model, the increase of world trade leads to an increase in the volume of exports as well. However, the impulse in world trade has, again, no effect on national product and on employment.

The results for model M3 in table 2 illustrate that this insensitivity of the Minfordian model to a world trade shock is caused by the assumption of equilibrium on the labour market. When this assumption is relieved the rise in world trade leads, as usual in policy models, to an increase of national product and of employment. In the first quarter these effects are, according to M3, enhanced by a decrease of real wages due to a lagged reaction of nominal wages to the rise of prices. In the following periods the impact on national product and on employ-

ment is less sizeable as real wages somewhat exceed baseline level.

When, in model M4, we also assume disequilibrium on the goods market, the results of table 2 show an impact multiplier of world trade on domestic economic activity of 2.5 to 3. Now the increase of world trade does not lead to rising prices and hence to an appreciation of the guilder. Hence the increase in world trade is fully reflected in an equal rise in the volume of imports and exports.

Model M5, where the Cobb-Douglas labour demand function is replaced by the quasi vintage approach, gives almost the same simulation results as M4. The major difference is that, due to lagged reactions, the effect on employment in M5 is lower in the first quarter and somewhat higher at the end of the simulation period.

Table 3. The effects of an increase in foreign prices by 10%.
(in % of the baseline projection, unless stated otherwise)

on	according to	Mod M2 (altern. Minf. model)			Mod M3 (disequ. labour market)			Mod M4 (disequ. goods& labour market)			Mod M5 (idem, vintage approach)		
	after	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr
Volume of income (y)		-0.0	-0.0	0.0	-2.6	-0.4	0.1	1.3	2.2	0.2	1.4	2.5	0.7
Volume of exports (b)		-0.0	-0.0	0.0	2.3	0.8	-0.2	4.4	7.7	0.9	4.4	7.8	1.1
Volume of imports (m)		0.0	0.0	-0.0	-0.2	0.1	0.0	1.6	6.5	1.2	1.2	5.5	1.0
Expenditure price level (p_y)		10.0	10.0	10.0	7.0	10.1	10.1	4.2	5.9	9.6	4.2	5.8	9.5
Real wage level (w_r)		0.0	0.0	-0.0	-3.2	-0.7	0.2	-1.8	0.8	0.4	-1.9	1.0	0.7
Real exchange rate (x)		0.0	0.0	0.0	-2.8	0.0	0.1	-5.2	-3.7	-0.4	-5.3	-3.8	-0.5
Demand for labour (a)		0.0	0.0	0.0	0.6	0.3	-0.1	0.4	0.5	-0.0	0.1	0.4	0.3
Unemployment (U) (in labour years x1000)		-	-	-	-25	-11	2	-16	-20	1	-6	-15	-9

The effects of a once and for all rise of foreign prices by 10% are given in table 3. No results are shown for M1 as foreign prices do not play a role in this model. Because in M2 the labour market should be in equilibrium, there is no effect on real wages. Hence, the goods market equilibrium requires that the rise in foreign prices is immediately and fully transmitted to domestic prices. That's why a 10% increase in foreign prices, according to M2, leads to no other reaction than to an immediate 10% increase of domestic prices. In principle, the same holds for the other models as well, but in these cases lags are much longer. In M3, with disequilibrium on the labour market, deviation from purchasing power parity mainly occurs in the first quarter of the simulation period. In that quarter the decline of real wages leads, in spite of the slowdown of economic activity because of lower disposable income, to a rise of employment. In the following periods these effects fade away. Table 3 shows positive effects on national product in the first quarters of the simulation period for the policy-models-look-alikes M4 and M5. The main differences of effects according to the latter models again relate to different lags in labour demand.

The impulse simulations of this section show that the assumptions of equilibrium on the labour and on the goods market have major implications for the way in which the Dutch economy is described to react on foreign shocks.

5. The effects of a reduction of employers' contribution to social security.

This section investigates how, according to the models, the economy reacts to a permanent reduction by 5%-points of the incidence of social security contributions paid by employers. As the simulation results in tables 4 and 5 show, the reaction varies from model to model. In discussing the results we will focus on the long run effects, because the impulse paths show hardly any oscillations. Nevertheless, the tables also contain the short run effects.

In the Minfordian equilibrium models (M1 and M2) the influence of a reduction of employers' social security contributions on national product and on employment is negligible. Equilibrium on the labour market is maintained by a rise of the real wage rate (i.e. earnings). Hence the advantage of the lower contributions is passed on to the labourers for the greater part. This is due to the low wage elasticity of labour supply, which, in conformity with empirical findings for the Netherlands, has been set to a value of 0.2.

Table 4. The effects of a reduction of the employers' wage taxation rate by 5%-points.
(in % of the baseline projection, unless stated otherwise)

on	according to	Mod M1 (Minfordian model)		Mod M2 (altern. Minf. model)			Mod M3 (disequ. labour market)			Mod M4 (disequ. goods& labour market)		
	after	1qu	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr
Volume of income (y)		0.0	0.0	0.0	0.0	0.0	0.7	1.0	1.0	0.8	1.1	1.9
Volume of exports (b)		0.0	0.0	-1.0	-1.5	-1.2	-0.1	0.5	0.5	0.1	0.9	3.8
Volume of imports (m)		0.0	0.0	0.4	0.6	0.5	0.7	0.8	0.8	0.9	1.2	4.4
Expenditure price level (p_y)		-	-	1.3	0.7	0.6	0.1	-0.4	-0.3	-0.1	-0.6	-1.9
Real wage level (w_r)		4.0	4.0	4.8	4.5	4.4	2.4	1.4	1.4	2.6	1.5	2.1
Real exchange rate (x)		-0.0	-0.0	1.3	0.7	0.6	0.1	-0.4	-0.3	-0.1	-0.6	-1.9
Demand for labour (a)		0.0	0.0	0.1	0.0	0.0	0.7	1.0	1.0	0.7	1.0	1.1
Unemployment (U) (in labour years x1000)		-	-	-	-	-	-24	-37	-36	-24	-36	-40

In model M3 with wage setting on the labour market and equilibrium prices on the goods market a reduction of social premiums paid by employers leads to a more moderate rise of the real wage rate than in the equilibrium labour market models. The fall of real labour cost increases the demand for labour and the supply of goods. In order to maintain equilibrium on the goods market the price level and through it the real exchange rate show a slight decline after the first year of the simulation period. Thus, in contrast with the Minfordian models, lowering social security premiums paid by employers has, under the assumption of

labour market disequilibrium, a positive effect on national product and employment.

In M4 the possibility of disequilibrium on the goods market is introduced. In fact, we have underutilization of capital during the simulation period. Although M4 does not show stronger employment effects than M3 it does have more favourable effects in terms of national product and real wages. In M4 the price fall due to lower labour cost is, at the end of the simulation period, sharper than in M3. Consequently, the demand for goods rises relative to the supply of goods and the utilization rate of capital increases. In accordance with Okun's Law the increase of national product will surpass the increase of employment.

Summarizing table 4, it appears that the stronger the disequilibrium character of the model, the more we can rely on the positive effects of reducing employers' contributions to social security. The results of the sensitivity analysis in table 5 reveal that this conclusion is independent of the real wage elasticity of labour demand, which, in the central variant, is set to a value of -0.4 (see eq. 1a). A different value of this elasticity has virtually no incremental effect on employment and income in the equilibrium models and only a slight effect in the disequilibrium model M4 with respect to the time path of labour demand.

Table 5. The effects of a reduction of the employers' wage taxation rate by 5%-points.
(in % of the baseline projection, unless stated otherwise)

on	according to	Mod M1 (wage el. labour demand = -0.2)		Mod M1 (wage el. labour demand = -0.6)		Mod M2 (wage el. labour demand = -0.2)			Mod M2 (wage el. labour demand = -0.6)			Mod M4 (wage el. labour demand = -0.2)			Mod M4 (wage el. labour demand = -0.6)		
	after	1qu	6yr	1qu	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr
Volume of income (y)		0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	-0.0	0.7	0.9	1.9	0.9	1.3	1.9
Volume of exports (b)		0.0	0.0	0.0	0.0	-1.0	-1.4	-1.3	-1.1	-1.5	-1.2	0.1	0.9	3.9	0.1	0.8	3.7
Volume of imports (m)		0.0	0.0	0.0	0.0	0.5	0.6	0.5	0.5	0.6	0.5	1.0	1.5	4.6	0.9	1.0	4.3
Expenditure price level (p_y)		-	-	-	-	1.2	0.8	0.7	1.2	0.7	0.6	-0.1	-0.7	-1.9	-0.1	-0.6	-1.9
Real wage level (w_r)		3.9	3.9	4.0	4.0	4.6	4.4	4.3	4.8	4.5	4.5	2.6	1.5	2.1	2.6	1.6	2.3
Real exchange rate (x)		-0.0	-0.0	-0.0	-0.0	1.2	0.8	0.7	1.2	0.7	0.6	-0.1	-0.7	-1.9	-0.1	-0.6	-1.9
Demand for labour (a)		0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.5	0.7	1.0	0.9	1.3	1.2
Unemployment (U) (in labour years x1000)		-	-	-	-	-	-	-	-	-	-	-17	-26	-37	-31	-47	-39

6. The effects of a reduction of employees' contribution to social security.

This section analyses the effects of a once and for all reduction of wage taxes and employees' contribution to social security (hereafter wage taxation rate) by 5%-points. The results are shown in tables 6 and 7.

In the equilibrium model M1 a reduction of the wage taxation rate stimulates effective labour supply. This supply shift presses the

real wage rate down and evokes an increase of labour demand and hence of employment and income. These effects are very small.

In M2 the transmission of this impulse is much more complicated. The reduction of the wage taxation rate causes a rise in disposable income, which pushes up demand. As this rise of demand is not matched by an equal rise of supply, the assumption of equilibrium on the goods market leads to higher prices and hence to a rise of the real exchange rate. Therefore the volume of exports decreases and the volume of imports increases. The overall effect of the impulse on national product and employment is, like in M1, negligible due to the inelastic labour supply, so that, in spite of the reduced social security premiums, the real wage rises in order to secure labour market equilibrium.

In the models with disequilibrium on the labour market a reduction of the wage taxation rate increases registered labour supply in stead of effective labour supply. Because of the assumption of equilibrium on the goods market in M3, the same mechanism with respect to the price level and foreign trade is at work as in M2. However, now we see a decline of real wages instead of a rise, as real wages are no longer instrumental in clearing the labour market. Thus, according to M3, the impulse leads to a slight increase of national product and employment. Relaxation of the assumption of equilibrium on the goods market results in a further enhancement of the positive effects of the reduction of the wage taxation rate on national product and employment. This is illustrated by the simulation results for M4 and M5 in table 6. The quasi vintage approach of M5 is most favourable to labour demand. Because labour supply rises along with labour demand in models M3, M4 and M5, the change of unemployment is relatively small as compared to that of employment.

Table 6. The effects of a reduction of the employees' wage taxation rate by 5%-points.
(in % of the baseline projection, unless stated otherwise)

on	according to Mod M1 (Minfordian model)		Mod M2 (altern. Minf. model)			Mod M3 (disequ. labour market)			Mod M4 (disequ. goods& labour market)			Mod M5 (idem, vintage approach)		
after	1qu	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr
Volume of income (y)	0.1	0.1	0.1	0.1	0.1	0.9	0.5	0.5	1.5	1.6	1.7	1.3	1.7	2.0
Volume of exports (b)	0.1	0.1	-1.8	-2.5	-2.0	-1.3	-2.6	-2.7	0.0	0.3	1.2	0.0	0.4	1.1
Volume of imports (m)	0.0	0.0	0.8	1.0	0.8	1.3	1.6	1.6	2.8	5.2	6.5	2.6	4.8	5.2
Expenditure price level (p_y)	-	-	2.2	1.3	1.0	1.7	1.4	1.4	-0.0	-0.2	-0.6	-0.1	-0.3	-0.6
Real wage level (w_r)	-0.2	-0.2	1.1	0.6	0.4	-1.1	-0.7	-0.5	-0.2	0.2	0.5	-0.3	0.3	0.6
Real exchange rate (x)	-0.0	-0.0	2.2	1.3	1.0	1.7	1.4	1.4	-0.0	-0.2	-0.6	-0.1	-0.3	-0.6
Demand for labour (a)	0.1	0.1	0.1	0.1	0.1	0.8	0.6	0.5	0.7	0.8	0.7	0.2	0.9	1.1
Unemployment (U) (in labour years x1000)	-	-	-	-	-	-28	-21	-16	-25	-25	-21	-5	-32	-35

Table 7. The effects of a reduction of the employees' wage taxation rate by 5%-points.
(in % of the baseline projection, unless stated otherwise)

on	according to	Mod M1 (coëf. wage-lab.sup.:0.1)		Mod M1 (coëf. wage-lab.sup.:0.3)		Mod M2 (coëf. wage-lab.sup.:0.1)			Mod M2 (coëf. wage-lab.sup.:0.3)			Mod M5 (coëf. wage-lab.sup.:0.1)			Mod M5 (coëf. wage-lab.sup.:0.3)		
	after	1qu	6yr	1qu	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr
Volume of income (y)		0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	1.3	1.7	2.0	1.3	1.7	2.0
Volume of exports (b)		0.0	0.0	0.1	0.1	-1.9	-2.6	-2.1	-1.7	-2.4	-1.9	0.0	0.3	1.1	0.0	0.4	1.1
Volume of imports (m)		0.0	0.0	0.1	0.1	0.7	1.0	0.8	0.8	1.0	0.8	2.6	4.8	5.2	2.6	4.8	5.2
Expenditure price level (p_c)		-	-	-	-	2.4	1.3	1.0	2.1	1.2	1.0	-0.1	-0.3	-0.5	-0.1	-0.3	-0.6
Real wage level (w_r)		-0.1	-0.1	-0.3	-0.3	1.3	0.7	0.5	0.9	0.5	0.3	-0.3	0.3	0.6	-0.3	0.2	0.6
Real exchange rate (x)		-0.0	-0.0	-0.1	-0.1	2.4	1.3	1.0	2.1	1.2	1.0	-0.1	-0.3	-0.5	-0.1	-0.3	-0.6
Demand for labour (a)		0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.9	1.1	0.2	0.9	1.1
Unemployment (U) (in labour years x1000)		-	-	-	-	-	-	-	-	-	-	-6	-33	-37	-3	-30	-33

Table 7 presents the results of the sensitivity analysis with respect to the value of the wage elasticity of labour supply, which, in the central variant, is set to 0.2 (see eq. 3a and 3b). We see that varying this coefficient value somewhat affects the effects on real wages in the Minfordian models. The change in effect on the other variables, and in the disequilibrium model M5, is negligible. It appears that, due to wage inelasticity, the specification of labour supply has no big influence on the calculation of the effects of a reduction of wage taxation.

7. The effects of a change in the benefit wage ratio.

In this section we compare the different models as to their reaction to a reduction of the benefit wage ratio by 5%-points. The results in table 8 show that in the equilibrium models the effects on national product and on employment are relatively large. The curtailment of benefits makes effective labour supply increase. The real wage rate falls in order to secure labour market equilibrium. Consequently, employment and national product end up at a higher level. Moreover, in M2 the clearing prices on the goods market are below baseline level, so that the enhanced competitive position leads to a strong growth of the volume of exports.

Contrary to what we noticed in the two previous sections, in this section the disequilibrium models show much smaller effects than the equilibrium models. In the disequilibrium labour market models a negative benefit impulse is transmitted via the labour market as well. A reduction of the benefit wage ratio enhances registered labour supply. The falling utilization rate of labour exerts a downward pressure on the real wage rate (Phillips-curve effect) which is insufficient to eliminate the labour market imbalance. Because of this wage rigidity the disequilibrium labour market models are less responsive to a benefit wage reduction than the equilibrium models. The resulting rise of national product and employment appears to be very small. As the increase in labour supply is much larger than that of labour demand, the reduction of the benefit wage ratio leads, according

to the disequilibrium models, to a considerable rise in registered unemployment. We note, however, that the size of this rise in unemployment may be exaggerated due to the fact that we have used similar labour supply specifications in the equilibrium and disequilibrium models. Finally, table 8 shows that with respect to this impulse the differences in working between the disequilibrium models are remarkably small.

Table 8. The effects of a reduction of the benefit wage ratio by 5%-points.
(in % of the baseline projection, unless stated otherwise)

on	according to	Mod M1 (Minfordian model)		Mod M2 (altern. Minf. model)			Mod M3 (disequ. labour market)			Mod M4 (disequ. goods& labour market)			Mod M5 (idem, vintage approach)		
	after	1qu	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr
Volume of income (y)		1.0	1.0	1.1	1.0	1.0	0.0	0.1	0.1	-0.0	0.0	0.2	-0.0	0.0	0.2
Volume of exports (b)		1.2	1.1	2.3	2.3	1.9	0.1	0.3	0.3	0.0	0.1	0.5	0.0	0.1	0.4
Volume of imports (m)		0.6	0.6	0.2	0.2	0.2	-0.0	0.0	0.0	-0.1	-0.2	0.1	-0.1	-0.2	0.1
Expenditure price level (p_y)		-	-	-2.8	-1.1	-0.9	-0.1	-0.2	-0.1	-0.0	-0.1	-0.3	-0.0	-0.1	-0.2
Real wage level (w_r)		-2.8	-2.8	-4.2	-3.1	-2.9	-0.2	-0.4	-0.3	-0.2	-0.4	-0.3	-0.2	-0.5	-0.4
Real exchange rate (x)		-0.6	-0.6	-2.8	-1.1	-0.9	-0.1	-0.2	-0.1	-0.0	-0.1	-0.3	-0.0	-0.1	-0.2
Demand for labour (a)		1.0	1.0	1.1	1.0	1.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2
Unemployment (U) (in labour years x1000)		-	-	-	-	-	53	50	48	54	50	48	56	51	45

Table 9. The effects of a reduction of the benefit wage ratio by 5%-points.
(in % of the baseline projection, unless stated otherwise)

on	according to	Mod M1 (coëf. repl. ratio: 1.0)		Mod M1 (coëf. repl. ratio: 1.4)		Mod M2 (coëf. repl. ratio: 1.0)			Mod M2 (coëf. repl. ratio: 1.4)			Mod M5 (coëf. repl. ratio: 1.0)			Mod M5 (coëf. repl. ratio: 1.4)		
	after	1qu	6yr	1qu	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr	1qu	1yr	6yr
Volume of income (y)		0.6	0.6	1.6	1.5	0.7	0.7	0.6	1.7	1.6	1.6	-0.0	0.0	0.1	-0.1	0.0	0.2
Volume of exports (b)		0.7	0.7	1.8	1.8	1.4	1.5	1.2	3.6	3.5	3.1	0.0	0.1	0.3	0.0	0.2	0.6
Volume of imports (m)		0.4	0.4	0.9	0.9	0.1	0.1	0.2	0.4	0.3	0.4	-0.1	-0.1	0.1	-0.1	-0.3	0.1
Expenditure price level (p_y)		-	-	-	-	-1.8	-0.7	-0.6	-4.3	-1.7	-1.5	-0.0	-0.1	-0.1	-0.0	-0.1	-0.3
Real wage level (w_r)		-1.8	-1.7	-4.3	-4.2	-2.7	-2.0	-1.9	-6.5	-4.8	-4.7	-0.2	-0.3	-0.2	-0.4	-0.7	-0.7
Real exchange rate (x)		-0.4	-0.4	-0.9	-0.9	-1.8	-0.7	-0.6	-4.3	-1.7	-1.5	-0.0	-0.1	-0.1	-0.0	-0.1	-0.3
Demand for labour (a)		0.6	0.6	1.6	1.5	0.7	0.6	0.6	1.7	1.6	1.6	0.0	0.1	0.1	0.0	0.2	0.4
Unemployment (U) (in labour years x1000)		-	-	-	-	-	-	-	-	-	-	35	32	28	86	79	70

Table 9 presents the results of the sensitivity analysis with regard to the coefficient of one minus the replacement ratio in the labour supply equation (eq. 3a and 3b), which is given the value of 1.2 in the central variant. The outcome of the impulse simulations appears to be highly dependent upon the value of this coefficient. This is especially true for the equilibrium models. Hence, in case this type of models is to be used in policy analysis, much empirical attention is needed for obtaining good estimates of this parameter. Up to now reliable estimates of this parameter are absent, at least in the Netherlands. Therefore,

even if the equilibrium models were more appropriate for modelling the Dutch economy than the disequilibrium policy models actually used, not much can be said about the viability of a policy of reducing the replacement ratio in order to enlarge employment.

8. Conclusions.

The aim of this paper is twofold. Firstly it investigates the influence of alternative policy measures with respect to social security on economic activity and on the labour market using stylized empirical macroeconomic models for the Netherlands. Secondly it analyses the consequences for the working of the models of disequilibrium modelling versus equilibrium modelling of the labour and goods market.

The main conclusion from our exercises are as follows:
1. In all models the policy effects are rather small due to low elasticities in the labour supply and labour demand equations.
2. Reduction of the incidence of taxes and social security contributions is more effective according to the disequilibrium models than according to the equilibrium models.
3. Reduction of the replacement ratio is more effective according to the equilibrium models than according to the disequilibrium models.

Hence the question of effectiveness of social security policy in enhancing economic activity and employment appears to be closely related to the way of modelling the labour market and the goods market. In case an equilibrium model is appropriate, a reduction of the replacement ratio is most effective, whereas in case the labour and goods market are supposed to be in disequilibrium, a reduction of social security contributions is to be preferred. Unfortunately, the poor information content of macroeconomic data will never allow us to discriminate between equilibrium and disequilibrium models using econometric methodology. Therefore the choice between equilibrium and disequilibrium models has to be partly based on judgement and on theoretical considerations. Empirical microeconomics and institutional knowledge may be helpful in assessing such judgement. In the Netherlands there are indications of serious labour market rigidities so that from that point of view disequilibrium modelling seems adequate. Moreover, modern microeconomic theory can very well explain the existence of labour market rigidities. For that reason theoretical arguments no longer automatically lead to a preference for equilibrium models.

References.

Atkinson, A.B., 1981, Unemployment Benefits and Incentives, in: J. Creedy (ed.), The Economics of Unemployment in Britain (Butterworths, Londen), pp. 128-149.

Butter, F.A.G. den, 1987, Model en Theorie in de Macro-economie (Stenfert Kroese, Leiden).

Compaijen, B., J.A. Vijlbrief and R. Zelle, 1989, Labour Market and Social Security: A Minfordian Model for the Netherlands (Free University, Amsterdam), mimeo (forthcoming).

Davis, J. and P. Minford, 1989, Germany and the European Disease, in: J. Muysken and C. de Neubourg (eds.), Unemployment in Europe (McMillan, Londen), pp. 316-342.

Minford, P., 1983, Labour market equilibrium in an open economy, Oxford Economic Papers (November Supplement on Employment), 35, pp. 207-244.

Springer, K.A., J.A. Vijlbrief en B. Compaijen, 1988, Werkgelegenheid, Werkloosheid en Sociale zekerheid, OSA-werkdocument nr. W 51, 's Gravenhage.

ANNEX

A. Equations.

(1) Labour demand (non-vintage approach)

a. $\ln a = \text{const} - 0.4 \ln [\, w_r (1+t_q)\, x^{-m_q} \,] + 0.0 \ln k + 0.0025\, T + 0.5 \ln q_k$

(2) Labour demand (by quasi vintage approach)

a. $a = \text{const} + a^* - 0.5 \left(1 - \tfrac{1}{4} \sum_{j=0}^{3} [y/y^{nt}]_{-j} \right) a^*$

b. $a^* = 0.018 \{ 1 + 0.5 (1-h) \}\, k\, e^{-\Sigma\mu/100} \,.e^{-0.01\Sigma(c_{af}-1)}$

c. $y^{nt} = y^{nb} \,.\, y/y_{bn}$

d. $y^{nb} = (1/\kappa)\, k\, e^{\Sigma\mu'/100}$

e. $k = k_{-1} + i - k_a$

f. $k_a = 0.015 (1 + 0.25 [\mu - 1.25])\, c_{af}\, k_{-1}$

g. $(\dot{w}-\dot{p})_{gem} = \tfrac{1}{4} \sum_{j=0}^{3} (\dot{w}-\dot{p})_{-j}$

h. $(r-\dot{p}^e)_{gem} = \tfrac{1}{4} \sum_{j=0}^{3} (r-\dot{p}^e)_{-j}$

i. $c_{af} = \{ 1 + 0.4 \left[\dfrac{(\dot{w}-\dot{p})_{gem} - 4\mu}{4\mu} \right] \} \{ 1 - 0.015 [(r-\dot{p}^e)_{gem} - (r-\dot{p}^e)_0] \}$

(3) Labour supply

a. $\hat{a}_a = \text{const} + a_a \left(1 - 0.005 \,/\, \{ [w_r(1-t_a)]^{0.2} [1-w_u/w]^{1.2} \} \right)$
(equilibrium labour supply)

b. $a_a = \text{const} + 0.625\, a_p \left(1 - 0.005 \,/\, \{ [w_r(1-t_a)]^{0.2} [1-w_u/w]^{1.2} \} \right)$
(disequilibrium labour supply)

c. $U = a_a - a - a_{ov}$

d. $q_L = 1 - U/a_a$

e. $a_g = a_{g-1} \{ 1 + \frac{1}{4} [\frac{y/(a + a_{ov}) - y_{-4}/(a + a_{ov})_{-4}}{y_{-4}/ (a + a_{ov})_{-4}}]\}$

(4) Exports and imports

a. $\ln b = \text{const} + 0.6 \ln b_{-1} + 1.0 (\ln m_w - 0.6 \ln m_{w-1}) + 0.8 \ln 1/x$

b. $\ln m = \text{const} + 0.6 \ln m_{-1} + 1.0 (\ln y - 0.6 \ln y_{-1}) - 0.3 \ln 1/x + 1.0 \ln q_k$

(5) Other expenditure

a. $\ln c = \text{const} + 0.2 \ln c_{-1} + 0.64 \ln y_b - 0.3 \ln \{(r+100)/(\dot{p}^e+100)\}_{-1} + 0.12 \ln m2$

b. $\ln i = \text{const} + 0.2 \ln i_{-1} + 0.8 \ln y - 1.2 \ln \{(r+100)/(\dot{p}^e+100)\}_{-1} + 0.12 \ln m2 + 0.4 \ln q_k$

c. $i_{gem} = \frac{1}{4} \sum_{j=0}^{3} i_{-j}$

d. $i_{wo} = (i_{gem} / i_{gem-1}) i_{wo-1}$

e. $n = 0.005 y$

f. $y = c + i + i_{wo} + g + b - m + n + y_{aut}$

g. $y_b = w_r (1 - t_a) (a + a_{ov}) \times 10$

(6) Supply of goods

a. $\ln y^{nb} = \text{const} + 1.0 (\ln a - 0.5 \ln q_k) + (1-1.0) \ln k + 0.01 T$

b. $y = (y/y_{bn})\ y^{nb}$

c. $y^{nt} = (y/y_{bn})\ y^{nb}$

d. $y^{n} = 0.975\ y^{nt}$

e. $q_k = y/y^{n}$

f. $q_k = 1$

(7) Wage formation

a. $w_r = f\ (a - \hat{a}_a = 0)$
(labour market equilibrium)

b. $\ln w = \text{const} + 0.5 \ln w_{-1} + 0.5 \ln p_v + 0.25 \ln q_L + 0.5 \ln a_g + 0.125 \ln (1+t_a) + 0.425 \ln (1+t_q)$
(wage equation: labour market disequilibrium)

c. $w = w_r\ p_v\ (1+t_q)$

d. $\dot{w} = \Delta^4 \ln w \times 100$

e. $w_r = w\ /\ \{(1+t_q)\ p_v\}$

(8) Price formation

a. $p_v = f\ (y - y^{n} = 0)$
(goods market equilibrium)

b. $\ln p = \text{const} + 0.8 \ln p_{-1} + 0.12 \ln w + 0.05 \ln q_k - 0.16 \ln a_g + 0.1 \ln (1+t) + 0.08 \ln p_m$
(price equation: goods market disequilibrium)

c. $\dot{p} = \Delta^4 \ln p \times 100$

d. $\ln p_v = \{1/(1+m_q)\} \ln p + \{m_q/(1+m_q)\} \ln p_m$

e. $\ln p = (1+m_q) \ln p_v - m_q \ln p_m$

(9) Exchange rate formation

a. $x = m / b$

(current account equilibrium)

b. $p_m = p_v / x$

c. $e = p_m / p_{bu}$

d. $p_m = e\ p_{bu}$

e. $x = p_v / p_m$

B. Models.

Mod M1 : (1) + (3a) + (4) + (6a) + (6b) + (6f) + (7a) + (9a)
(Minfordian model: equilibrium on labour market and on current account; no reaction lags in eq. 4)

Mod M2 : (1) + (3a) + (4) + (5) + (6a) + (6c) + (6d) + (6f) + (7a) + (7c) + (8a) + (9d) + (9e)
(Alternative Minfordian model: labour and goods market equilibrium, exogenous exchange rate)

Mod M3 : (1) + (3b) + (3c) + (3d) + (3e) + (4) + (5) + (6a) + (6c) + (6d) + (6f) + (7b) + (7e) + (8a) + (9d) + (9e)
(disequilibrium on labour market, equilibrium on goods market)

Mod M4 : (1) + (3b) + (3c) + (3d) + (3e) + (4) + (5) + (6a) + (6c) + (6d)+ (6e) + (7b) + (7e) + (8b) + (8d) + (9d) + (9e)
(disequilibrium on labour and goods market; Minfordian labour demand)

Mod M5 : (2) + (3b) + (3c) + (3d) + (3e) + (4) + (5) + (6d) + (6e) + (7b) + (7d) + (7e) + (8b) + (8c) + (8d) + (9d) + (9e)
(disequilibrium on labour and goods market, labour demand by quasi vintage approach)

C. List of symbols.

a	labour demand by enterprises	
a_s	measured labour supply	
$\hat{a}_s$	effective labour supply	
a_g	labour productivity	
a_{ov}	labour demand by government	#
a_p	working age population	#
a^*	full capacity labour demand by enterprises	
b	volume of exports	
c	volume of private consumption	
c_{af}	index of scrapping (=1 in case of a constant life of capital goods)	
e	exchange rate index (1977=1); guilders in foreign currency	
g	volume of government expenditure	#
h	index number of hours worked in enterprises (1970=1)	#
i	volume of gross fixed investments (enterprises)	
i_{wo}	volume of gross investments in dwellings	
k	volume of capital stock	
k_s	scrapping of capital stock	
m	volume of imports	
m_w	world trade index (1977=100)	#
m2	volume of broadly defined money stock	#
m_q	ratio of imports to income	#
n	volume of stockbuilding	
p	price index of gross national product (1977=1)	
$\dot{p}$	rate of price inflation	
$\dot{p}^e$	inflationary expectations	#
p_{bu}	index of foreign prices (1977=1)	#
p_m	index of import prices (1977=1)	
p_v	price index of demand	
q_k	utilization rate of capital stock	
q_L	utilization rate of labour	
r	(long term) interest rate	#
T	time trend	#
t	burden of taxation	#
t_a	wage taxes and employees' social security contributions (as % of earnings)	#
t_q	employers' social security contributions (as % of earnings)	#

U	unemployment	
w	nominal wage rate (including employers' social security contributions)	
$\dot{w}$	rate of wage inflation	
w_r	real wage rate (earnings)	
w_u/w	replacement ratio	#
x	real exchange rate	
y	volume of (gross) national product	
y_{aut}	autonomous part of volume of (gross) national product	#
y_b	disposable wage income	
y/y_{bn}	ratio of national product and production by enterprises	#
y^n	stuctural or natural level of income	
y^{nb}	productive capacity of enterprises	
y^{nt}	total productive capacity	
κ	capital output ratio	#
μ	labour saving technical progress	#
μ'	capital saving technical progress	#

Explanatory note: # indicates variables which are exogenous in all models.

LABOUR MARKET EFFECTS OF THE SOCIAL SECURITY SYSTEM IN THE NETHERLANDS
An empirical comparison of equilibrium with disequilibrium models

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Abstract

The elements of the social security system, such as unemployment benefits, minimum wages and contributions by employers and employees, may affect both labour demand and labour supply in various ways. This paper investigates to what extent the measured effects of the social security system on the labour market depend on the way of modelling the social security system. Starting point of the analysis is the well known Minford model, modified and adapted to the Dutch situation. This model assumes equilibrium on the labour market. However, policy analysis in the Netherlands is traditionally based on disequilibrium modelling of the labour market. This paper analyses the differences in the working of the models by consecutively replacing the specifications of the model equations which are typical to the Minford model by specifications which stem from the traditional Dutch policy models. It is shown that the assumption that the labour market clears in each period, which in Minford's model implicitly determines the wage level, has a major influence on the model's measurement of the impact of social security policy.

LES EFFETS DU SYSTEME DE LA SECURITÉ SOCIALE HOLLANDAISE SUR LE MARCHÉ DE L'EMPLOI.
Une comparaison empirique des modèles d'équilibre avec des modèles de déséquilibre

Resumé

Les éléments du système de la sécurité sociale, tels que les allocations chômage, le S.M.I.C. et les contributions par les employeurs et les employés peuvent atteindre la demande aussi bien que l'offre de l'emploi. Cette recherche a pour objet de comprendre la façon par laquelle la structuration du système de sécurité sociale influence le marché de l'emploi. Le point de départ de l'analyse est le modèle bien connu par Minford, qui a été modifé et adapté à la situation hollandaise. Selon ce modèle le marché de l'emploi se trouve toujours en équilibre. Cependant, l'analyse de gestion en Hollande a traditionellement utilisés des modèles de déséquilibre. L'étude fait une analyse de ces différences par la substitution successive des équations typiques du modèle de Minford par les équations des modèles de gestion traditionels hollandais. Il est démontré que l'hypothèse selon laquelle le marché de l'emploi se stabilise dans chaque période donnée, ce qui dans le modèle de Minford détermine implicitement le niveau du salaire, a un effet majeur sur l'interprétation par le modèle de l'influence du système de sécurité sociale.